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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/524,627

02/02/2005

Heiner Scheer

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EXAMINER

WHITE, DENNIS MICHAEL

ART UNIT

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1797

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/524,627	<b>Applicant(s)</b> SCHEER ET AL.	
	<b>Examiner</b> DENNIS M. WHITE	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 12-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/02/2005</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. Preliminary amendment filed on 2/2/2005 cancelling claims 1-11 and adding new claims 12-28 is noted. Therefore, claims 12-28 are currently pending.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 12-15, 18-20, 22-23, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by La Prieta et al (DE 19857468 A1).

Regarding claims 12 and 20, La Prieta et al teach a layered sensor element comprising: an insulation (Figure 1: 3 and 4); a heating meander (“heater printed conductor situated in a layer plane of the sensor element, the heater printed conductor including a heater”) and a heater lead (“Zuleitungen” col. 3 lines 14-18, col. 4 lines 5-18), the heater printed conductor being embedded in the insulation (Figure 1: 11 embedded in 3 and 4); and a sealing frame (“surrounding the insulation in a layer plane of the heater printed conductor at least in some areas, wherein an extension of the sealing frame in a direction parallel to a layer plane of the sensor element and perpendicular to a longitudinal axis of the sensor element at least in some areas amounts to at least 25 percent of an extension of the sensor element in the direction” and “extension of the sealing frame in the direction parallel to the layer plane of the sensor element and perpendicular to the longitudinal axis of the sensor element in the

feed area amounts to at least 25 percent of the extension of the sensor element in the direction”) (Figure 1: 2 shows sealing frame is about 28% of the width).

Regarding claims 13-15, La Prieta et al teach a sensor element that is fully capable of detecting the temperature and concentration of a measuring gas (“wherein the sensor element is for detecting a physical variable of a measuring gas”).

Regarding claim 18, La Prieta teach the sensor element further comprising first and second solid electrolyte films (Figure 1: 1 and 5), and wherein the sealing frame (Figure 1: 2), the insulation (Figure 1: 3 and 4), and the heater printed conductor (Figure 1:11) are situated between the first and second solid electrolyte films, and the sealing frame surrounds the insulation and extends to an outside surface of the sensor element (Figure 1).

Regarding claim 19, La Prieta teach the heater printed conductor has the heater in a measuring area of the sensor element, and the heater leads leading to the heater in a feed area of the sensor element (Figure 2G: lower portion is measuring area and upper portion is feed area).

Regarding claim 22, La Prieta teach the sensor element wherein the heater printed conductor includes heater leads stacked on each other (“situated in different layer planes of the sensor element”) (Figure 1: 11 shows two leads stacked on each other).

Regarding claim 23, La Prieta teach the sensor element, wherein the sealing frame is made of  $\text{ZrO}_2$  (“the sealing frame is gas-tight”).

Regarding claim 26, La Prieta teach the sensor element further comprising at least one electrochemical cell having a first electrode (Figure 1: 16) and a second electrode (Figure 1: 17) as well as a solid electrolyte situated between the first and the second electrode (Figure 1:10), a reference gas space (Figure 1:12), which contains a reference gas and in which the first electrode is situated, being situated in the sensor element (col. 2 lines 59-66).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over La Prieta in view of Jach et al (USP 6,261,429).

La Prieta teach the limitations of claims 12 and 19 as per above.

Regarding claims 16 and 21, La Prieta et al teach the extension of the sealing frame in the direction parallel to the layer plane of the sensor element and perpendicular to the longitudinal axis of the sensor element is about 28%. La Prieta et al is silent about a range of 30 percent to 80 percent of the extension of the sensor element in the direction. The heater leads seem to be reducing in size in Fig. 2G the percentage of the sealing frame width would be increasing. Therefore if the sealing frame width remained constant the percentage of the sealing frame would fall within the range.

Jach et al teach a sensor element for an electrochemical sensor. Comprising a heating device having one heating conductor and two heating conductor leads insulated and further sealed by a sealing frame. The sealing frame percent of the width increases as it seals the heating conductor leads. It is notoriously well known to keep the outer surface of the sealing frame straight and smooth because it allows the sensor to be easily inserted into the main body units of known gas sensors which provide the gas.

Therefore it would have been obvious to one of ordinary skill in the art to keep the outer surface of the sealing frame of La Prieta constant as in the Jach et al device

because it provides the sensor the ability to be inserted into the main body unit of gas sensors. Since the percentage increases as it reaches the feed portion the La Prieta/Jach would teach the range of 30 to 80 percent of the width ("wherein the extension of the sealing frame in the direction in the feed area amounts to 30 percent to 80 percent of the extension of the sensor element in the direction").

8. Claims 17 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over La Prieta in view of Tanaka et al (USP 4,328,294).

La Prieta teach the limitations of claim 12 as per above.

Regarding claims 17 and 27-28, La Prieta et al teach the sensor element wherein the sealing frame has a solid electrolyte, zirconium oxide (col. 2 line 59-60). La Prieta et al are silent about the zirconium oxide is stabilized by yttrium oxide.

Tanaka et al teach a solid electrolyte for an oxygen concentration sensor comprising zirconium oxide and a stabilizer of yttrium oxide (col. 3 lines 64-67). The solid electrolyte comprises further a sintering promoter of silicon oxide of 0.2 to 2% by weight ("sealing frame contains an admixture of silicon oxide of 0.1 percent to 1.0 percent by weight" and "wherein the admixture of silicon oxide is 0.5 percent by weight") (col. 2 lines 42-50). It is advantageous to add yttrium oxide and silicon oxide in order to stabilize the crystal structure and promote sintering, respectively.

Therefore it would have been obvious to one of ordinary skill in the art as motivated by Tanaka et al to add yttrium oxide and silicon oxide to La Prieta in order to stabilize the crystal structure and promote sintering with the reasonable expectation of success.

9. Claims 24-25 is rejected under 35 U.S.C. 103(a) as being unpatentable over La Prieta in view of Bosch et al (USP 6,634,210).

La Prieta teach the limitations of claim 12 as per above.

Regarding claims 24-25, La Prieta are silent about the layer thickness of the sealing frame and the heater printed conductor having insulation is in a range of 52  $\mu\text{m}$  to 74  $\mu\text{m}$  and the layer thickness is 60  $\mu\text{m}$ .

Bosch et al teach a sensor comprising a heater and substrates wherein the thickness of each substrate can be up to about 200 micrometers thick, with a thickness of about 50 to about 180 micrometers more preferred. The thickness of each substrate can be determined based on the desired thermal response time of the self-regeneration cycle, where shorter thermal response times require a smaller thickness. (col. 5 lines 42-53). It is advantageous to use the substrates having these thicknesses because they give a desired thermal response.

Therefore it would have been obvious to one of ordinary skill in the art as motivated by Bosch et al to use the sealing frame and the heater printed conductor having insulation thickness range of 52  $\mu\text{m}$  to 74  $\mu\text{m}$  and the layer thickness is 60  $\mu\text{m}$  in the device of La Prieta because it gives a desired thermal response.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS M. WHITE whose telephone number is



Art Unit: 1797

(571)270-3747. The examiner can normally be reached on Monday-Thursday, EST 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lyle A Alexander/  
Primary Examiner, Art Unit 1797  
Dmw